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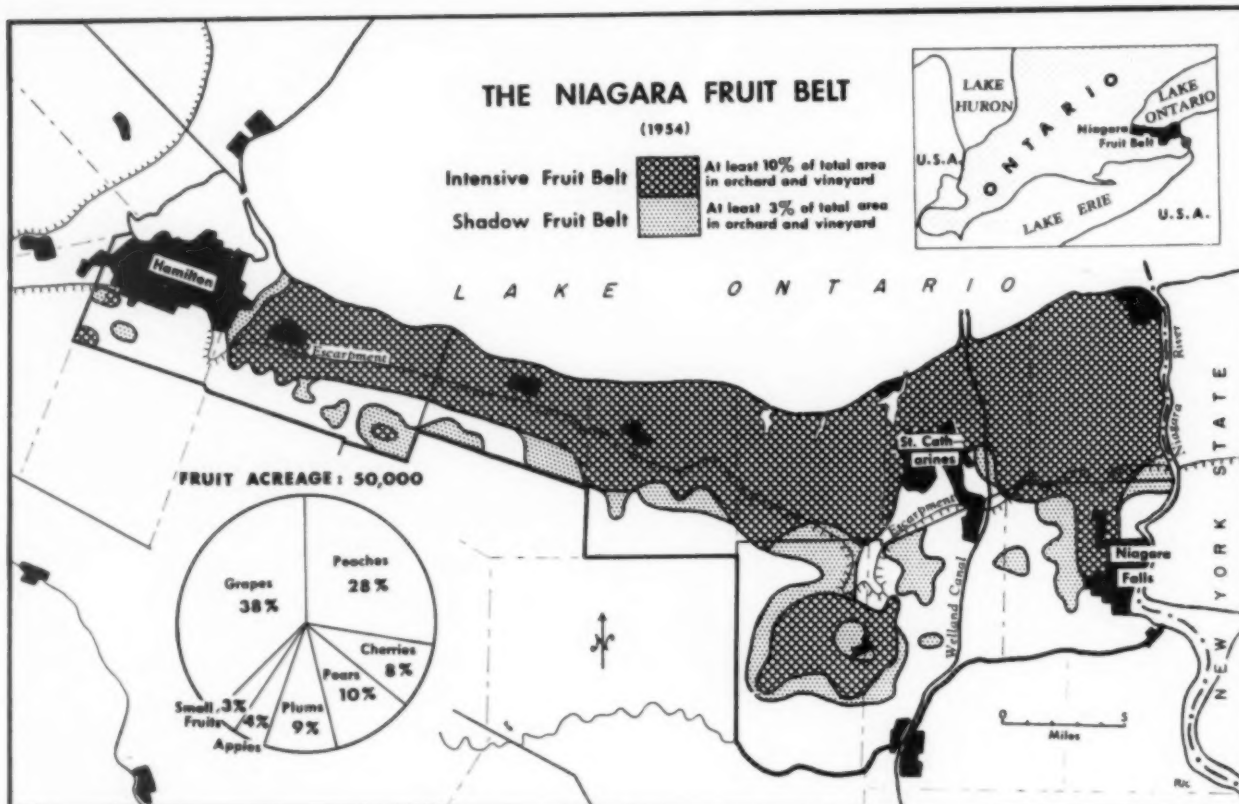
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The Disappearing Niagara Fruit Belt

by RALPH R. KRUEGER

Ontario Department of Lands and Forests photographs, 1954, except where credited.

IN RECENT years there has been much concern in Canada over the spread of urban land uses on to the choice fruitland of the Niagara fruit belt. Commentators and editors of all the news media, as well as industrialists, fruit growers, geographers, planners, and government spokesmen, have been debating how much urban expansion has been affecting the fruit industry, and whether anything should be done to direct urban growth away from the best fruitland. On the one hand there has been nostalgic lamenting that, "Industrial expansion will soon make the Niagara blossoms just a memory", and on the other hand, there has been the warning that, "We cannot halt progress". The title of an article published not long ago — "Future: Fruitland, Factories or Families?" perhaps best sums up the question that concerns the Canadian public.

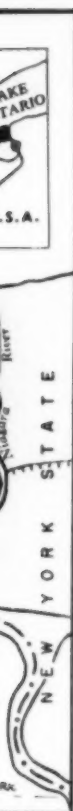
Fruit Growing

The Niagara fruit belt extends along the south shore of Lake Ontario from Hamilton to the Niagara River. Although the most intensive fruit growing is located on the narrow plain between the foot of the Niagara Escarpment and Lake Ontario, some orchards and vineyards have spilled over the Escarpment.

It is a well known fact that the Niagara fruit belt produces most of Canada's peaches and grapes, as well as large amounts of apples, pears, plums, cherries, small fruits, and vegetables. However, fruit growing has not always been the predominant agricultural activity in this area. In the early part of the nineteenth century the areas cleared of forest were devoted almost entirely to grain and livestock farming. As a side line, some farmers began growing fruit and vegetables for nearby cities

At top:—

The Niagara fruit belt was first delimited on a township basis from census statistics. The boundaries of the actual fruit growing areas were then refined from aerial photographs. The most intensive fruit growing is carried on north of the Niagara Escarpment.



THE DISAPPEARING NIAGARA FRUIT BELT

and towns. The farmers who had sandy soils, which grew relatively poor grain and hay crops, discovered that light textured soils were preferable for fruit growing and market gardening. Since fruit and vegetable growing proved to be more profitable than general farming, the farmers began specializing in the former. Besides supplying fruit and vegetables to the nearby cities and towns, the Niagara fruit growers also began growing apples for export to Europe. In fact, in the latter half of the nineteenth century, the Niagara region produced more apples than any other tree crop.

The change from apple to peach as the dominant tree crop began around 1890 when British Columbia and Nova Scotia started competing with Ontario for the foreign apple market. Niagara apple growers were at a disadvantage in this competition because of the high costs of transporting the apples to sea-board. Since there was a good home market for peaches, fruit growers began replacing apple orchards with peach orchards.

In peach growing, Niagara growers find that they have a comparative advantage. They are next door to the largest market area in Ontario:

the string of cities around the western end of Lake Ontario. The well drained, light textured soil required by peaches is found in large contiguous areas, which makes peach growing possible on a scale large enough to be economic.

However, it is the superior "peach climate" of the Niagara fruit belt that has given it the greatest advantage over other competing areas in Ontario. Its proximity to a large body of water which is slow to warm up in spring, delays peach blossoming a week or two — a sufficient delay to miss most spring frosts. Essex County, in the extreme south-west corner of the Ontario Peninsula, has approximately the same average last spring frost date as the Niagara fruit belt, but has a higher probability of spring frost blossom injury because of the earlier blossoming date.

In winter, Lake Ontario, which is warm relative to the temperature of the surrounding land, moderates the cold air masses before they reach the Niagara region. This gives the Niagara fruit belt more moderate winters than the rest of the Ontario Peninsula. From 1897 to 1904, a series of very cold winters killed almost all of the peach trees in Kent and Essex

Niagara orchards make an impressive sight at blossom time. Blossom Sunday attracts thousands of tourists.

Ontario Department of
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Counties (most south-westerly area of Ontario) while Niagara peach orchards suffered very little injury. Thus, by 1905 the Niagara fruit belt had a virtual monopoly in peach production, and the production of peaches has been increasing ever since, while apple growing has been constantly declining.

Along with an increase in peach production, there has been a constant increase in grape growing in the Niagara fruit belt. Expansion from the 1860s was gradual until 1945 when a sudden increase in demand for fresh grapes and wine, both in Canada and the United States, led to a rapid increase in grape acreage. Between 1945 and 1956 there was an increase of approximately thirty per cent in grape acreage in the Niagara fruit belt.

Accompanying the increase in peaches and grapes, there has been a small increase in pears, plums, and cherries. Although these fruit crops are not as prone to low temperature injury as peaches, the trees live much longer and produce larger crops in areas where the climate is similar to that of the Niagara fruit belt.

Urban Expansion

Besides being uniquely endowed with the physical requirements for fruit growing, the Niagara fruit belt is ideally located for industrial and urban development. It shares with the "Golden Horseshoe" (a popular name given to the urban complex around the western end of Lake Ontario) a rich agricultural hinterland, cheap water transportation, an excellent network of highways and railroads, and an abundant supply of fresh water.

In recent years the "Golden Horseshoe" has experienced a more rapid population growth than any other area in Canada. Between 1951 and 1956 the population of the "Golden Horseshoe" increased by approximately one-half million, an increase which represented about one-quarter of the total Canadian population increase for the five-year period. This rapid urban growth in the "Golden Horseshoe" is occurring in the urban sprawl pattern characteristic of most growing Anglo-American cities.

Although the greatest increase has been occurring in the Toronto area, the Niagara fruit belt has also been experiencing con-

siderable population growth. Between 1951 and 1956, the population of the Niagara fruit belt area increased by 68,000. This growth is evidenced by the many new housing subdivisions sprawling out in all directions around Hamilton, St. Catharines, and Niagara Falls, and the numerous individual houses strung out along the main roads leading to the cities.

Reduction of Fruitland

A study of aerial photographs of the Niagara fruit belt has revealed that about 12,000 acres of farmland were occupied for urban land uses between 1934 and 1954. Although orchards and vineyards were being replaced by housing subdivisions around the cities, fruit growing was intensifying so rapidly in other areas of the fruit belt that for a number of years the fruit crop acreage continued to increase despite urban encroachment. In fact, between 1931 and 1951 the area in fruit crops increased by 17,000 acres despite the large loss of farmland.

However, by 1951 the acreage of fruit crops lost to urban land uses started to become greater than the acreage of new plantings. Between 1951 and 1956 the Niagara fruit belt suffered a loss of approximately 2,000 acres of fruit.

Still more significant than the loss of actual fruit crop acreage is the 2,700-acre loss of the light textured "peach soil" to urban land uses between 1934 and 1954. Only about one-third of the fruit belt has "peach soil", the only soil on which the major tree crop of peaches can be successfully grown.

There are several factors which intensify the seriousness of the loss of "peach soil". The 2,700-acre loss is the actual area occupied by urban land uses. This does not include many large areas of choice fruitland in the path of urban expansion which lie idle, awaiting development. Nor does this figure indicate the loss of fruit production which results from the subdivision of farms into smaller units, which occurs around cities. These small farms, often operated on a part-time basis, are usually less productive per acre, and often constitute a source of disease and insect infection for the surrounding orchards. Also, when urban development is approaching, there is reluctance to



Urban expansion on to the fruitland east of Hamilton. In the five-year period between 1951 and 1956, 2,000 acres of fruit were lost to urban land uses. The city of Hamilton is at the left; Lake Ontario can be seen in the upper right corner, and the Niagara Escarpment along the bottom edge.

plant new orchards which take at least five years to mature.

Two other factors, in addition to those discussed above, tend to discourage farming in the rural-urban fringe areas: increasing property taxes and high land prices. The influx of

non-farm people to a rural municipality is accompanied by a greater demand for services, which results in higher property taxes. Since the farms have much larger assessments than the non-farm dwellings, the brunt of the increased taxes falls on the agricultural land.

High prices offered for farmland also accompany urban expansion into a rural community. Fruit farmers in the Niagara fruit belt are being offered as high as \$2,000 to \$5,000 an acre for their land. In the face of increasing property tax and such high prices for land, farmers feel that they cannot afford to farm, and are quite willing to sell. Often the land is sold to a speculator who either holds the land idle or leases it for a limited period. If left idle the land produces no crops and becomes a source of disease and insect infection for the surrounding fruit farms. If it is leased, productivity is reduced because a short-term lease offers little incentive for good farming practices which take a number of years to yield results.

Field observations indicate that in the past few years urban expansion on to the fruitland has been occurring at a rapidly increasing rate. It is the writer's estimate that if urban expansion continues in the present sprawl patterns at a constantly increasing rate, the Niagara fruit belt will cease to exist as a major fruit growing area by about 1980.

Importance of Niagara Fruit Production

Since urban expansion is reducing Niagara fruit production, and since all evidence points to an even more rapid urban growth in this area in the future, the question arises as to how important Niagara fruit production is to the provincial and national economy. Or, to reword the question: Is the Niagara fruitland worth saving?

In order to give a rational answer to this question, one must consider, among others, factors such as (i) importance of adjacent market (ii) value of production and (iii) possibility of alternate supply.

Importance of Adjacent Market

The Niagara fruit belt is adjacent to one of the largest and fastest growing markets in Canada: the "Golden Horseshoe". This urban concentration around the western end of Lake Ontario contains almost one-half of Ontario's $5\frac{1}{2}$ million people.

Proximity to market is very important for fresh fruit selling. This is particularly true for peaches since they damage very easily if

picked ripe, and lose a great deal of their flavour if picked too green. Niagara fresh fruit sales amount to approximately \$4 million annually. This is approximately one-fifth of the total value of Canadian fresh fruit consumption of the type grown in the Niagara region.

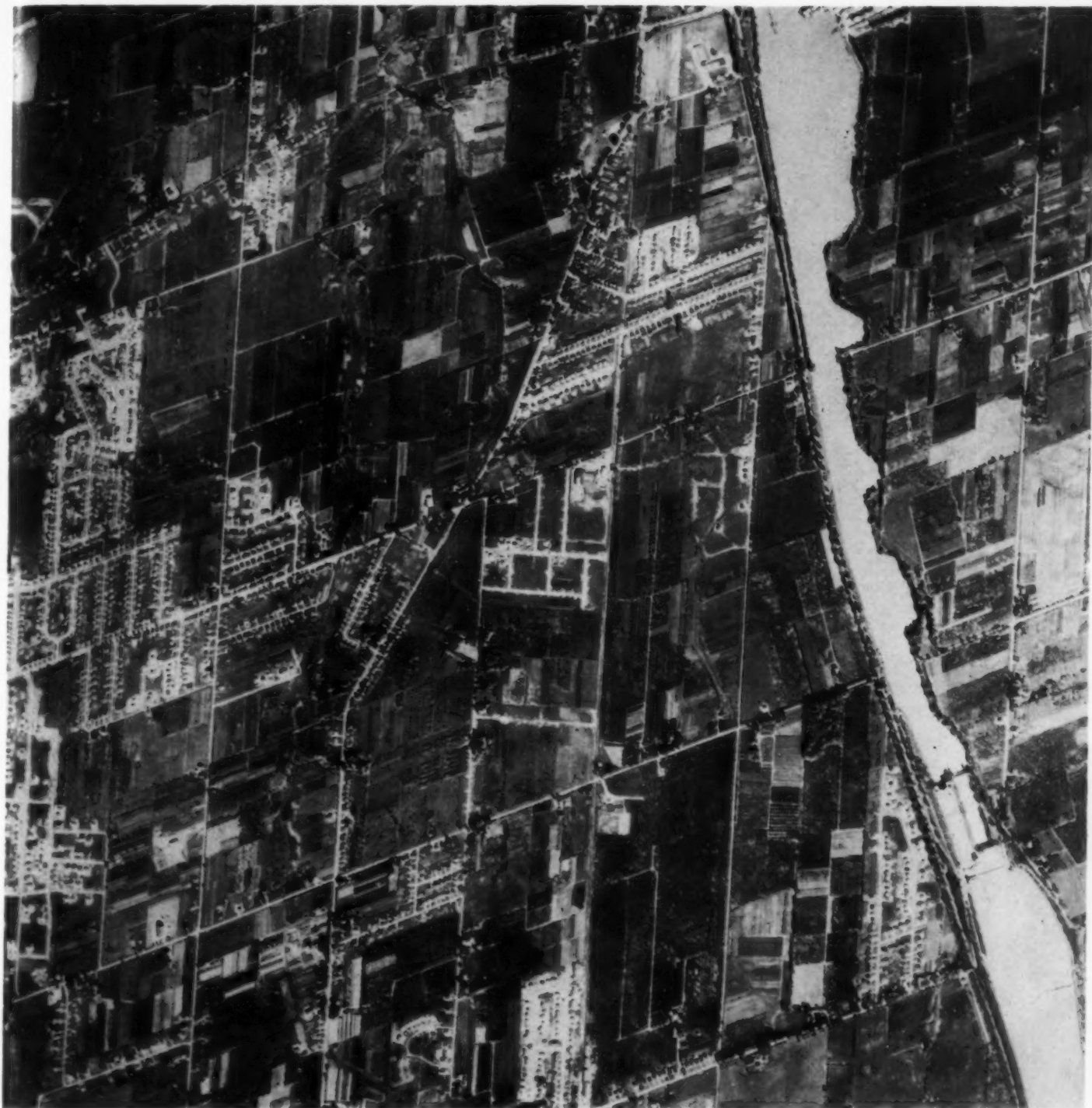
Although in years of bumper fruit crops the Niagara fruit belt has an unsaleable surplus, analysis of population statistics indicates that this is a temporary condition. If the rate of population growth experienced in the "Golden Horseshoe" between 1951 and 1956 continues, this area will have a population of $3\frac{1}{4}$ million by 1966 and $4\frac{3}{4}$ million by 1976, which would mean a doubling of the size of the fruit market in the highly urbanized area immediately adjacent to the fruit belt.

The Niagara fruit belt also partially supplies the fresh fruit market of the rest of Southern Ontario and the Montreal-Quebec City area, both of which have rapidly growing populations. It certainly appears that there is going to be a much greater demand for Niagara fruit in the future. In fact, even if the Niagara fruitland can hold its own against urban encroachment, it will not be long before the local domestic demand for fruit will be greater than the Niagara fruit belt can supply.

Value of Production

The Niagara fruit belt contributes a large percentage of both the Ontario and the Canadian total fruit production. The annual gross value of Niagara fruit production is between \$10 and \$11 million, which is over 50 per cent of the Ontario total and about 25 per cent of the national total. The Niagara fruit belt accounts for approximately 80 per cent of the national grape acreage, 60 per cent of the peach acreage, and over 50 per cent of the plum, pear, and cherry acreage.

That part of the Ontario fruit-and-vegetable processing industry based upon Niagara production has a plant investment of approximately \$14 million; annual gross sales of \$26 million; and annual wage and salary payments of \$5 million. The gross sales of the fruit-and-vegetable processing plants based on Niagara production represent approximately 20 per cent of the provincial total and 13 per cent of the national total.



St. Catharines urban sprawl. The Welland Ship Canal appears on the right.

The value of the annual gross production of the intensive Niagara fruit growing area averages \$400 to \$500 an acre. This is three or four times as much as the gross production per acre in general mixed farming areas of Ontario.

In summary, it is no exaggeration to say that

the Niagara fruit belt is one of the most valuable areas of farmland in all of Canada.

Possibility of Alternate Supply

Domestic Supply. If most of the present Niagara producing fruitland is put out of

production, the question arises as to where an alternate supply of fruit will be obtained for the fresh market and the fruit processing plants.

Since grapes thrive on either sandy or clay soils they pose no problem. In the past few years the production of grapes has exceeded the domestic demand to the extent that one-third of the annual Niagara grape production has been exported to the United States for wine purposes. In addition to this, the grape acreage could be doubled in the Niagara Peninsula in areas not now occupied by fruit crops. Grape acreage also could be expanded greatly in other areas of the Ontario Peninsula where the winters are almost as moderate as those of the Niagara fruit belt.

Likewise, pears, plums, apples, and sour cherries can be grown on clay soils of the fruit belt in areas which are not adjacent to growing cities, and in other areas of the Ontario Peninsula.

Peaches, and to a lesser degree sweet cherries and some of the small fruit crops, are much more discriminating in both climate and soil requirements. They are more susceptible to winter wood kill, winter bud damage, and spring blossom injury. Moreover, they require a deep, well drained, light textured soil.

A peach climate study of Ontario by Mercier and Chapman indicates that no other area of Ontario has a climate so favourable to the growing of peaches as the Niagara fruit belt. The Kent-Essex area, which is second best, has twice as great a probability of peach crop loss due to winter and spring low temperature injury to peach blossom buds. The Kent-Essex area has almost sufficient acreage of "peach soil" to be able to replace Niagara peach production. Thus, it appears that the Kent-Essex area could replace most of the Niagara peach production, but with some loss in dependability of supply.

However, to what extent the Kent-Essex area *would* replace the Niagara supply is open to debate. The same conditions which make it possible to grow tender fruit crops in this area also make it profitable to grow vegetables for the fresh market and for processing. Because this area can mature vegetables earlier than

any other area in Canada, its vegetables receive the high prices prevalent in the spring and early summer. In 1956, Kent and Essex Counties had 34,000 acres in vegetables. Several traverses of these counties indicate that much of this vegetable crop is grown on soil that is suitable for peaches.

Thus, if this area were to replace Niagara fruit production, it appears that it might be at the expense of the vegetable crops now grown there. Some agricultural officials doubt that growers of reliable cash crops will change to the more complex business of growing the more hazardous tender fruit with its need for elaborate equipment and specialized know-how. Others believe that, if the Niagara fruit belt disappears, peach growing will increase sufficiently in the Kent-Essex area to replace most of the lost Niagara production.

The Okanagan Valley of British Columbia is the only major Canadian fruit growing district outside of Ontario which can produce tender fruit crops such as peaches. The "peach climate" of the Okanagan Valley is less favourable than that of the Niagara fruit belt (about equal to that of the Kent-Essex area), and the area suitable for fruit production is greatly restricted by topographic and soil conditions. The greatest handicap, however, to Okanagan competition in the Ontario fruit market is the great transportation distance. Only occasionally does a carload of British Columbia peaches reach Toronto. Of the major cities in Canada, Winnipeg seems to be the most easterly centre supplied with British Columbia fruit in any quantity.

Foreign Supply. Canada already imports large quantities of fruit of the type grown in the Niagara fruit belt. The annual value of imported fresh fruit (Niagara type tree fruit) is approximately \$10 million. This is about equal to the total value of Niagara fruit production and is two-and-one-half times the value of Niagara fresh fruit sales. Slightly more than half of the peaches, pears, plums, and cherries sold on the fresh fruit market are imported. Much imported fruit comes from the United States before the Canadian fruit harvest season. During the harvest season, Canadian fruit is protected by an increased tariff. In the summer



Urban growth in the Niagara Falls orchard district. Both the old and new hydroelectric power canals appear in the upper right corner. The famous Whirlpool Rapids can be seen at right centre.

of 1958, the Canadian Government announced that this tariff would be based upon the cost of production plus a fair amount of profit, instead of upon the value at point of entry as had previously been done. This is deemed necessary to prevent distress selling of United States end-

of-the-season surplus fruit on the Canadian market at the beginning of the harvest season.

When vegetables and small fruits are added to tree fruits, the total Canadian imports of fresh fruits and vegetables from the United States amount to about \$50 million annually.

In addition to this, Canada imports millions of dollars worth of canned and frozen fruit from the United States each year.

There is little doubt that the United States could replace Niagara peach production. However, since the adjacent states of New York and Michigan cannot supply their own demand, this fruit would have to come from distant places such as South Carolina and California. This would result in lower quality peaches on the Ontario market. The supply would also be less dependable because peach crop losses due to spring frosts are much greater in the United States South than they are in the Niagara fruit belt.

An increase in imports of fruit from the United States would add further to Canada's annual trade deficit of well above one billion dollars with that country. Since it is difficult to increase exports to the United States, Canada has been attempting to limit to some degree the amount of imports from the United States. Any action, or lack of action, which would result in the reduction of domestic production of fruit and encourage imports from the United States, would appear to run counter to general Canadian trade policy.

Possibility of Preserving the Fruitland

Primarily on the basis of its superior physical environment for tender fruit crops, and its proximity to the largest and fastest growing market in Canada, the writer believes that the Niagara fruitland is worth saving. However, it is not worth saving if such has to be done at the expense of industrial development. The annual value of Niagara fruit production (\$10 million annually) looks very small when compared with the gross value of production of the manufacturing industry in the Niagara Peninsula (\$1¼ billion).

Therefore the problem really resolves into, "Can the Niagara fruitland be preserved without impeding industrial development and urban growth?" or, "Is there room for both urban growth and fruit growing in the Niagara fruit belt?"

If any of the Niagara fruit belt should be saved for fruit production, it is the area with "peach soil", the only soil on which peaches,

the major Niagara tree crop, can be commercially grown. Luckily, in some townships, areas with soils which are not suitable for peaches are favourably located for industrial and housing development. In such cases it would seem wise municipal policy to direct urban development to those areas, because then the township could gain assessment from the new development without losing the big assessment of the highly productive peach growing area.

There are some areas, however, around the cities of Hamilton, St. Catharines, and Niagara Falls, where the best urban land, and the most likely to be developed in the near future, is coincident with areas of "peach soil". In such cases, the writer suggests that no attempt should be made to save the fruitland because it would mean impeding urban development.

The problem is really not the total area of fruitland occupied or to be occupied by urban expansion, but the uncontrolled, haphazard manner in which premature sub-divisions and individual houses are sprawling all over the fruit belt. If Hamilton were to quadruple its area, and all the other cities, towns, and villages were to double their area, and if urban growth took place compactly around the existing urban centres, the total loss of "peach soil" would be approximately 11,000 acres. Of this, about 4,500 acres would be in Saltfleet Township (immediately east of Hamilton), where the "peach soil and climate" are inferior to that of other parts of the fruit belt. This hypothetical case would permit an urban population increase in the Niagara fruit belt of about 1,000,000 (present urban population slightly over 300,000) and still leave over 25,000 acres of the best "peach soil" for fruit production. If the present trend of fruit growing intensification continues, this would make it possible to maintain approximately the present volume of fruit production.

Thus, it appears that there is room in the Niagara fruit belt for an urban population of approximately 1,300,000 without seriously reducing fruit production. The population growth seems to be a certainty. The preservation of much of the best fruitland, however, will be accomplished only if there is close co-operation among the municipalities involved



An intensive orchard area about seven miles west of St. Catharines, where several dozen rural non-farm homes are the only evidence of urban encroachment. There are still large areas such as this which could be preserved for fruit growing if the necessary regional planning were to come in time.

in preventing urban land uses from sprawling into all parts of the fruit belt.

Orderly and compact urban development would not only save much of the fruitland, but would also be advantageous to both the urban and the rural municipalities. Since most of the

townships in the Niagara fruit belt are not receiving enough industrial and commercial development to offset the tax deficit incurred by the non-farm dwellings, the urban-type development now occurring is an economic burden on the rural municipalities. When



Section of Queen Elizabeth Way which runs through thousands of acres of choice fruitland.
Ontario Department of Travel and Publicity

annexation takes place, the cities find that it is very expensive to extend services to low density sprawl areas, and also the haphazard pattern of development makes it almost impossible to develop the land in an orderly, efficient manner in the future.

Although the initiative for planning must come from the local municipalities, it is the Ontario Government's responsibility to see that the planning is done on a regional basis instead of in a piecemeal fashion. The Planning Act of Ontario gives the Minister of Planning and Development the authority to define and name a planning area upon the application of the municipalities concerned, or upon his own initiative where in his opinion it is in the interest of any area to be under one planning board. It is the duty of a planning board of

such an area to conduct the necessary research prerequisite for planning and draw up an official plan which must be adopted by the municipalities concerned and approved by the Minister.

By means of such planning legislation the municipalities concerned can collectively zone certain areas for specific land uses; can direct urban growth to desired areas by provision of services; can control the location, planning, and quality of housing sub-divisions; and can prevent ribbon development along highways and all forms of low density scattered housing.

The Ontario Government also has control over direction of urban expansion through the Department of Highways and the Water Resources Commission. Through its regulatory control of water supply and sewage disposal

THE DISAPPEARING NIAGARA FRUIT BELT

facilities and its financing power, the Ontario Water Resources Commission can indirectly assist municipalities in directing urban growth by assisting them in providing water and sewer facilities in areas where development is desired. There is little doubt that the Department of Highways, by building the Queen Elizabeth Way, has stimulated industrial development in the Niagara fruit belt, and has contributed to urban sprawl by making it possible for city workers to live many miles out in the country. If the anticipated second major highway between Niagara Falls and Hamilton were to be built above the Niagara Escarpment instead of below, much choice fruitland would be saved at the outset, and more urban development would be encouraged on the less valuable agricultural land above the Escarpment.

Summary and Conclusion

If the present rate and pattern of urban expansion continues, fruit growing in the Niagara fruit belt is going to be substantially reduced in the future. Since it is the best fruit

district in all of Canada (second only to California in the United States) for the growing of tender fruits such as peaches, and in view of a rapidly expanding adjacent market, it would be wise land-use policy to preserve the best fruitland of the Niagara fruit belt. It is reasonable to attempt to save the choice fruitland with "peach soil", because urban land uses are not as particular in soil requirements as are the tender fruit crops, and there are enough favourably located areas with "non-peach soil" to take up urban expansion for many years to come.

Ontario has the necessary planning legislation, and enough central control over the planning of highways, water supply, and sewage disposal to make it possible to control urban sprawl and direct urban development on a regional basis to less productive agricultural land. Orderly, compact development, which would result from regional planning, would not only save valuable fruitland, but would also be of social and economic advantage to both the cities and the adjacent rural municipalities.

The Welland Ship Canal cuts through the heart of the Niagara fruit belt. A second canal through the fruit belt is a future possibility.

National Film Board





Some Canadian Wild Flowers

Notes by Dr. H. J. Scoggan

Photographs by Donovan Clemson

Alpine Anemone (*Anemone Drummondii*)

Alpine Anemone (Anemone Drummondii). Member of the Crowfoot (Buttercup) Family. Native: mountains of Alaska, Yukon and Northwest Territories, south to California and Idaho. Flowering time: July to August. Distinguishing features: no petals, but the sepals resemble petals, are coloured bluish, and are $\frac{1}{2}$ to $\frac{3}{4}$ inch long; the small, dry fruits are covered with a woolly coat and grouped in a spherical head at the top of the stem; the leaves are deeply cleft and each division is itself deeply cleft; the stem is covered with silky hairs; the root-stock is stout and has a fibrous coating.

Cotton-grass (*Eriophorum Chamissonis*)

Right:—Cotton-grass (Eriophorum Chamissonis). Member of the Sedge Family. Native: boggy ground from Alaska to James Bay, south to Oregon, Colorado and Minnesota. Flowering time: June to July. Distinguishing features: stem stiff and grass-like, up to 20 inches tall, from underground stolons; short grass-like leaves are borne from the top of reddish-brown sheaths surrounding the stem; the solitary spikelet at the top of the stem bears a cluster of small flowers which later give rise to a cluster of fruits with long, cinnamon-colour bristles.





Spring Beauty (*Claytonia lanceolata*)

Spring Beauty (*Claytonia lanceolata*). Member of the Purslane Family. Native: hills and mountains from British Columbia to Saskatchewan, south to California and New Mexico. Flowering time: April to July. Distinguishing features: 2 sepals; 5 broad rose-coloured petals with purplish veins; flowers several, about $\frac{1}{2}$ inch long; one solitary long-petioled leaf from the base of the stem and 2 broad sessile opposite leaves from near the middle of the stem; stem up to 9 inches tall from a bulb-like corm.

Mission Bell (*Fritillaria pudica*)

Mission Bell (*Fritillaria pudica*). Member of the Lily Family. Native: rich soil on hill-sides and mountains from British Columbia and Alberta, south to California and Utah. Flowering time: April to May. Distinguishing features: 3 sepals; 3 yellow or orange petals; flower generally solitary, about $\frac{3}{4}$ inch long, nodding at the top of a stem 4 to 12 inches high; leaves linear, up to 4 inches long, scattered along the stem; stem from a scaly bulb.



Balsam Root (*Balsamorhiza sagittata*)

Balsam Root (Balsamorhiza sagittata). Member of the Composite Family. Native: hill-sides from British Columbia to Saskatchewan, south to California and Colorado. Flowering time: April to July. Distinguishing features: inflorescence has a large central "eye" of disk-florets, surrounded by a ring of yellow ray-florets about $1\frac{1}{4}$ inches long; leaves white-velvety, narrowly to broadly triangular, on long petioles mostly from near the base of the stem; root thick and edible.



In the fishing harbour at Sukkertoppen the Canadian Government ship Ernest Lapointe rides at anchor while the visiting party tours the town.

Northern Neighbour

by R. A. J. PHILLIPS

Photographs by the author

ABOUT a thousand years ago a group of Eskimos left their northern homeland in Canada and moved east into Greenland. In the autumn of 1958 ten of their Canadian kinsmen went to see how the travellers had fared.

It was an odd kind of family reunion, perhaps oddest in this lapse of time. The intervening centuries had treated the Canadian Eskimos and the Greenlanders very differently; yet in an almost common language, cultural heritage, and mutual curiosity they found a bond of kinship which still remained strong.

This is the story of that reunion, and of an

Arctic country so very similar to Canada's — except in what man has made of it.

The trip was more than a social visit. Planned as part of the Department of Northern Affairs' programme for exchanges of Arctic experience, it was an opportunity also for Government officials to study Greenlandic administration. The party included five members of the Ottawa administration, as well as ten Eskimo leaders selected from across the whole Canadian Arctic.

The project had its beginnings two years earlier when seven Greenlanders made a short visit to two Baffin Island communities aboard

the motor vessel *H. J. Rink*. The reports the voyagers brought home whetted Greenland interest in "the old country", the more so since it appeared that language would be no serious barrier to renewed ties. The National Council of Greenland issued the invitation, and Canada accepted.

Months of detailed planning preceded the departure of Canada's representatives from Frobisher Bay at the end of August. Geographical representation is a principle no less important in the Arctic than elsewhere in Canada, and the twelve selected Eskimo leaders had to represent many areas and callings. They also had to travel great distances by complicated routes to reach the departure point. Gifts had to be selected and made to give to the Greenland people on behalf of those who could not go. Ways had to be found to discharge the responsibilities of the absent travellers during the active Arctic summer. By mid-August the plans were laid and the representatives began to converge on Baffin Island.

Then a personal tragedy struck two Eskimos who were caught in their travels by a quarantine for measles. While they anxiously sat out the waiting period they contracted jaundice and their hopes for Greenland were lost. There was no time for others to take their place, and so the two administrators and the medical adviser in the party of officials were joined by an educationist and an economist.

Two and a half days out of Frobisher Bay, the Department of Transport ice-breaker

Ernest Lapointe arrived off Godthaab on Labour Day. It was a scene which none could have imagined. While the capital was still lost in the faint tracery of the mountains and the mists, the first of the welcoming party arrived on the ship which had borne the Greenlanders to Canada two years before. As the land came nearer, other vessels joined the procession: brightly painted flag-decked boats cutting patterns in the rich blue water surrounded by the erratic spray of rifle bullets fired in salute. From the flotilla came the sound of cheers and shouted greetings in the Greenlandic tongues from hosts impatient to know if they could understand the visitors.

The sounds of the flotilla were joined by the deep cannonade of salute from the land, and by the excited shouts of the people massed on the shore. Two and a half thousand people lined the greystone quay and the winding road from the lower town where Hans Egede had walked 235 years before in his mission of enlightenment to the Eskimos. That day the road could not be seen for people waving hands and pushing Danish flags to points of recognition: old people wearing the traditional dress of their forbears, and the very young looking excited but bewildered. There were the fishermen who provide Greenland with their commerce, the office workers from the centre of Greenland's administration, the nurses, the construction workers, the radio technicians, the Danes who have brought these people patiently to a higher stage of development than any other

Members of the Canadian party visiting Greenland.



Arctic people. But, above all, there were the Greenlanders, proud of their country, of what they have done and what they are, anxious to welcome the descendants of their forbears.

When the Canadian party landed it was a royal progress from the dock to the square, a procession constantly halted for the shaking of hands and hastily exchanged greetings. There were formal speeches in Greenlandic, in Danish and in English, speeches which highlighted the sense of history and even drama in the reunion after ten centuries. There were gifts full of the rich tradition of Greenlandic craftsmanship. And there was singing, the rich quiet singing of 2,500 voices raised in the Greenlanders' proud song of nationhood.

Thus began a tour of opening doors. From Godthaab to the small communities far above the Arctic Circle, and then south almost to Greenland's southern tip, each day of the month brought welcomes which exceeded even the enthusiasm of those who planned them. But the trip was far more than the mutual exchange of pleasantries, more than what must have been one of the most successful goodwill missions Canada has ever organized. It was also a study of Greenland's past and present which more and more seemed to assume the dimensions of a vision into Arctic Canada's future.

The first days were spent in Godthaab and

the winding fiord which lies near it. In the capital the Canadians saw the highest points of Greenland's material and social progress while just a few hours away were the small villages undergoing their quieter social revolutions. All this started more than two centuries ago when the first foundations of popular enlightenment were laid. More than a hundred years ago illiteracy was ended, a record which it may take Canada another half century to achieve. The path was gradually laid for the rapid progress of more recent times. As the old natural economy began to fail, the people moved into communities where they had permanent houses, where standards of health and education could be raised. Commercial fisheries were started in order to bring cash to buy food and clothing which the products of the land and sea could no longer provide.

Still Greenland was far from self-sufficient, nor is it so today. With a keen sense of responsibility for the less advanced people within its care, Denmark made a continuing heavy investment in the social and economic welfare of its island colony, an investment which so often it could ill afford. Still, in the Danish view, it was not enough. In the early 1950s, as a consequence of the exhaustive work of a royal commission, a new era of intensive development began. The Canadian visitors saw its fruits.

In Godthaab they met the senior members of



Despite industrialization Greenlanders take pride in their ancient skills on the sea. For the Canadian visitors they put on demonstrations of kayak rolling. Two Greenlanders watch as a third, immersed, turns over with his craft.



A typical Greenland welcome to Canadians at Sukkertoppen. Danish flags are flying everywhere and the townspeople are gathered along the shore to greet the visitors.

an administration committed to a bold plan of industrial development which may, or may not, within another twenty years make Greenland self-sufficient. In Godthaab the signs of political and social development were even more striking than the new industries up the coast. The fourteen-man National Council, all Greenlandic, had just concluded its annual session. They were leaving for their scattered homes where local councils formed another indispensable part of the pyramid of self-government. Though the guiding hand of Danes was still present and necessary, in every profession the Canadians found Greenlanders taking increasing responsibility for their affairs, and aspiring to more.

An afternoon's tour in Godthaab took the party through boat-works; a home for the aged; municipal baths, modern and spotless; a

printing plant which produces a fortnightly newspaper as well as many of the books which Greenlanders read; a power plant which brings electricity to every Godthaab home; a civic auditorium financed in part by community effort; a filtration plant and storage system which will enable all householders to have running water; a two and a half million dollar tuberculosis sanatorium, the largest Danish institution of this type outside Copenhagen. Then there was a morning at Broadcasting House. With its 25,000-watt transmitter Greenland Radio can blanket all Greenland and Canada's eastern Arctic. During the Canadian visit the station inaugurated a weekly programme to Canada's north. The Canadian Arctic, buffeted on all sides by foreign broadcasts, has no voice with which to reply.

Greenland Radio is more than a radio station;



Kangamiut is a typical Greenland fishing port, with its houses perched on the steep rocky shore. All Greenlanders here live in permanent homes. On the left is a modern apartment block. The houses are owned by Greenlanders.

under the leadership of the versatile Frederik Nielsen it is something of the cultural centre of Greenland. During the visit, the main foyer of this striking building was filled with literature in the Greenlandic language — original poetry and prose and translations from Danes or well-known English authors. Visits to such displays or the schools of Greenland showed almost more solid signs of the progress of a people than the most imposing of Greenland's factories and public institutions. Here were monuments greater and more lasting than stone: the Greenlandic teacher leading his class in grades which few Canadian Eskimos have reached as pupils; the Greenlandic playing flawlessly at the concert grand piano, playing even "O Canada", an air that few of our northern people know; the Greenlandic's name on the title-page of a book, recording and creating, stimulating his fellow men while Canadian Eskimos, far from having written books, have never had any written for them in their own language, and have access to very few translations.

All this had its effect upon the Canadian

visitors, but it was the effect of hope, ambition, goals rather than bitterness. What is past is past. It may be true, as is so often claimed, that Canada ignored its Eskimos too long, and that those who did know the Eskimos were too prone to push their own alien culture on them while letting the Eskimo traditions die out. The important thing is the present and the future, a future in which Eskimos of Canada, like their kinsmen not only of Greenland but of Alaska and even Russia, may have the opportunity to learn, to seek new horizons in their national life. Southern civilization brings its social problems to northern Canada, but there is much that can be usefully assimilated. Greenland has proved that.

The glitter of civilization did not tarnish when the Canadian party left Godthaab, nor did the welcome lose any of its verve. There were large towns with a population of about 1,500, like Sukkertoppen. The welcome was manifested in the sounds of cheers and deep-felt song, in the waving of flags, in the proud processions from place to place. There was the

fish-plant about as modern as one would see in southern Canada where fish were fast frozen, salted or made into meal for markets abroad. A few generations ago the Greenlanders who worked here endeavoured to live off the land and off the mammals of the sea, in a kind of natural economy, but this form of livelihood proved as precarious there as it has now in Arctic Canada. Lacking resources for other industries, Greenland turned to fishing. Whether the people go out in boats or labour in the factories, fishing brings the money to buy economic amelioration and security, while education has taught them the satisfactions of life. Their Church also has helped them in the adjustments they had to make, helped them to keep what was good in their old traditions, taught them to absorb all that could be gained from the new.

Beyond the fish-plant, the new water-pumping station, the kindergarten and all the other things which had been done, there was the sound of blasting and the roar of trucks as Sukkertoppen carved new futures from its rock. The most striking lesson from Greenland was its degree of accomplishment, but the second most vivid impression was the pace of what is still being done. Every inhabitant of West Greenland is in a permanent house, and to the casual observer the standard of housing seemed good. But Greenlanders spoke of overcrowding, and were impatient to have more and better living space. So each year more than a million dollars is spent on new housing, all of it owned by Greenlanders on very favourable long-term Government mortgages. Only a few dozen of Canada's Eskimos have the permanent homes so necessary to improve health standards and to lower infant mortality: no Canadian

Top:—Greenland Radio, with Frederik Nielsen (centre), broadcasts a welcome to the Canadians at Kapusligdat.

Centre:—A highlight of the tour was the trip through the coal-mine at K'utdligssat. Here Eskimo members of the party are dressed ready for the tour.

Right:—Greenlanders have adapted themselves well to their country's modern industry. These men and women are employed at the up-to-date fish-packing plant at Sukkertoppen. They are wrapping frozen fish for export.



Eskimo owns his own home, apart from those who have built shacks from the refuse of the white man. But these things can soon change.

An important part of Greenlandic life is the community hall, which may be modern and handsome like the hall at Godthaab, a project undertaken in co-operation with the townspeople and the Government, or it may be a more modest frame structure like the one which is perched beyond flights of winding wooden stairs atop Sukkertoppen's highest hill. These have played their part in Greenland's development whether the use is for the town meeting, lectures or entertainment. The facilities were strained to the utmost when the Canadians came.

There might be speeches, there would always be singing, and there was usually dancing. Many Greenlanders wore their traditional costumes as they undertook the well remembered choreography of their favourite dancers. It was hard for the Canadian Eskimos to reply, for their once-treasured drum-dance has been almost wiped from the face of the Arctic. But one or two remembered. When Charlie Gordon intoned the ancient song of the hunt and beat the wash-basin which had to do impromptu duty for the caribou skin-drum, the crowd arose in a great enthusiasm. When Charlie Smith did the swirling steps his fathers knew, the people screamed in their emotion. It was an unusual and inspiring moment for Canadian Eskimos to receive such an ovation to a demonstration of their native art.

Not all the towns had a plant as large as Sukkertoppen's, but almost always the centre of the town was the fish-plant, however simple its processes. Almost always. K'utdligssat was one exception, for here was Greenland's only

coal-mine, now producing enough to serve all Greenland, with hopes of some small surplus for export. The manager was an Englishman experienced in the coal-fields at home, but all the employees save two were Greenlanders. A little nervously at times, the Canadians toured this mine, through the winding tunnels, crawling along galleries so narrow that not all could filter through, edging through pit-props and damp coal. It was very interesting, but hardly an attractive way to make a living. Were all the new houses of the village, the fine church and school, the well stocked store worth it? Probably, but for Canadian Eskimos the question would be academic. There is coal in the Canadian Arctic, but it is unlikely to be mined, apart from the casual scrapings of the surface. For those Eskimos of Canada who choose to accept the opportunities which the mines of the Arctic will offer, their work will bear small relationship to the grimness of a coal-mine.

The far north seemed a bit more like home to Canadians who lived by the sea and made seal meat their staple of living. In all the tour there was only one village living thus, and it received only incidental cash from oil and seal-skins. There were many villages which still found seal, and many hunters who prided themselves in their prowess with the kayak. Displays of skill became a standard part of welcomes, displays which involved complete somersaults in water flecked with ice.

All this was in sharp contrast to the grassy villages of southern communities which know spring lamb better than seal stew. Even though Narssak has an *abattoir* that handles 9,000 sheep a year from the farms of southern Greenland, still the basis of the economy is fish. The climate of southern Greenland cannot support tree growth, but there are shrubs, grass for grazing and, unlike Arctic Canada, there are harbours open through the winter. There are occasional farms, but they are for livestock, usually on a small scale. Probably fewer vegetables are grown in the well tended gardens than in the greenhouses which are part of so many of Greenland's homes.

There were twelve ports of call in all, and the final one was Julianehaab, Greenland's southernmost town of any size. With its central



The best preserved ruin in Greenland is the church built by the followers of Eric the Red when the Vikings came from the East to colonize the land. It is in South Greenland, near Julianehaab.

Farewell to Greenland. The hills of Julianehaab fade as the Ernest Lapointe sets sail for Canada.



square of almost medieval-looking European houses and its graceful fountain, this town seemed to show a civilization almost more entrenched than Godthaab's. It might well be, for this was the area to which the first Vikings came almost a thousand years ago. In a fiord a few miles away one can see the foundations of the houses which these early European settlers built of stone as they tended their sheep, cattle and horses on farms still used by Greenlanders. These ruins are untouched and deserted but for one local family. But far more striking than the remains of houses is the cathedral of stone, intact but for roof, doors and windows, hardly a stone out of place. And nearby is the Viking stable almost as well preserved, where sheep of the twentieth century huddle in the winds.

It was more than the buildings of Julianehaab that were impressive. The greetings, which meant farewell to Greenland, were as moving as any in the month. Massed groups of uniformed Boy Scouts and Girl Guides alternated with finely costumed men and women all around the square. Behind them were all the people of Julianehaab waiting impatiently while the cool evening wind of early autumn made moving patterns in the jets of the fountain. A brass band played Greenland's anthem and "God Save the Queen". There were speeches, a pro-

cession to the magnificent community hall which Greenlanders had designed and built. There was an evening of dancing and quiet visitation before the final day.

When the ship was ready to move off, the band was there again, with all the colour of the town and a people proudly decked. There was no doubt about the sincerity of the regrets in the final leave-taking. This had been an exciting month for Greenland. They had satisfied a pent-up curiosity about their kinsmen from Canada, and now they had seen and talked to people of whom they had heard so much in newspapers, in books, by radio.

With the Canadians it was a little different. Most hardly knew what to expect, and none could have foreseen all that Greenland had to show. But an odd thing seemed to have happened to the Canadian Eskimos travelling for the first time in a foreign land. They had become Canadians as well as Eskimos, and they spoke with quiet enthusiasm about what Canada would do to bring a new life to its northern people.

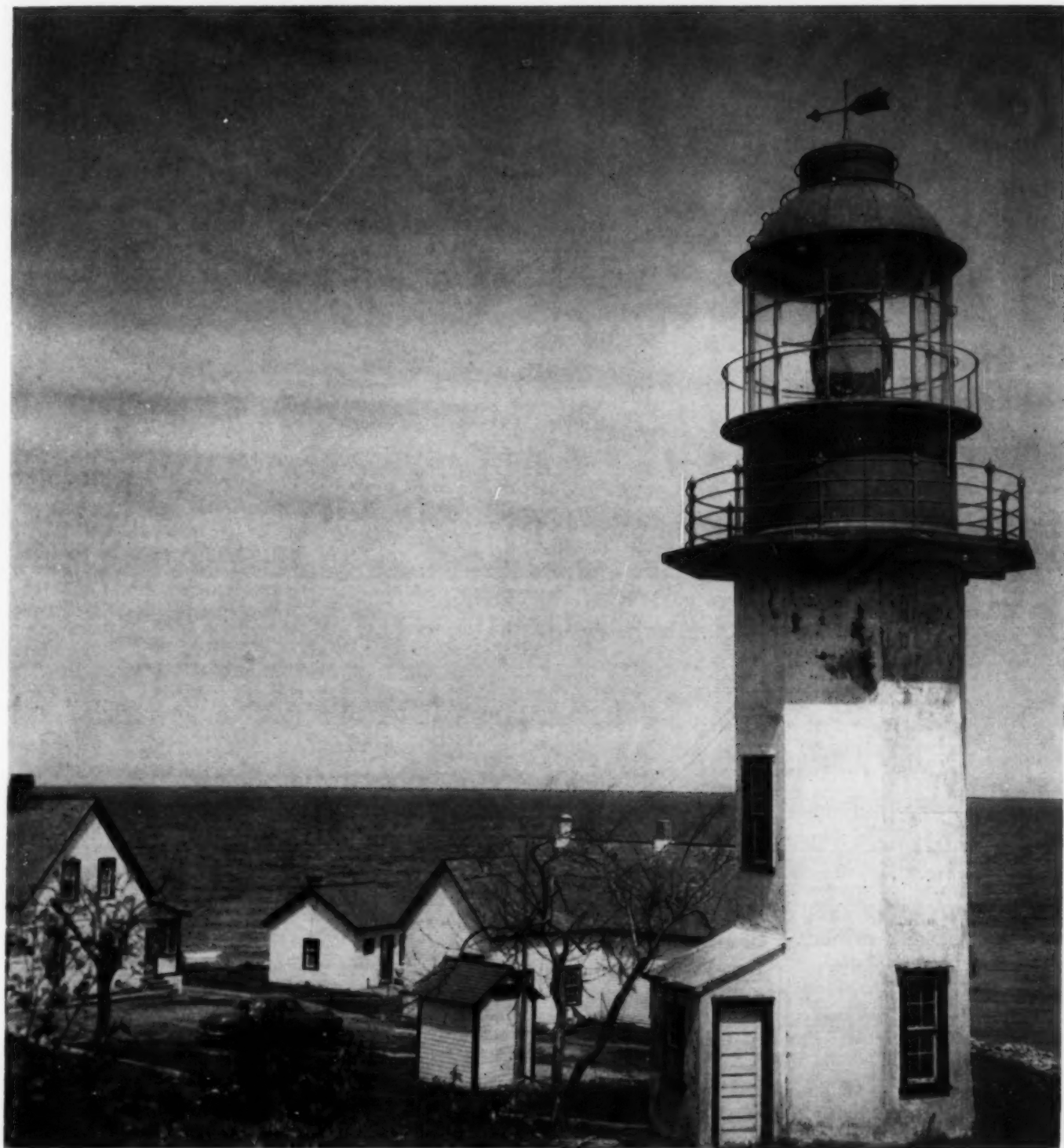
They did not speak of regret for the past. They spoke of their confidence in a future which they would help to build. They would do this for their children who yet might gain the life their Greenland kinsmen knew.



***Pictures of the
Provinces—XVII***

This dairy-farm near Sardis, British Columbia, forms a part of a farming district widely known for its pure-bred Ayrshire cattle.

B.C. Government Travel Bureau



Lighthouse overlooking Georgian Bay, at the tip of Cape Croker, immediately adjoining the main Indian reserve of Bruce Peninsula, Ontario.

Adelaide Leitch



The African bush, near Lusaka.

Northern Rhodesia

by BRIAN HITCHON

Photographs and map by the author.

NORTHERN RHODESIA, with an area of slightly over 290,300 square miles, comprises just over half the Central African Federation and lies between the latitudes $8^{\circ}15'$ south and 18° south and the longitudes 22° and $33^{\circ}33'$ east. With a total area of about 489,800 square miles, the Federation is the only country of equivalent size and importance in the world without direct access to the sea. Northern Rhodesia, the richest member of the Federation (due to the Copper Belt), is bounded on the south by Southern Rhodesia, a self-governing country within the Federation, and South West Africa, and on the north by the Belgian Congo (a Belgian colony) and the British-administered United Nations Trust Territory of Tanganyika. To the west and east lie the Portuguese Provinces of Angola and Mozambique, and the British Protectorate of Nyasaland, the third and poorest member of the Federation.

With the exception of the Zambezi, Luangwa and Kafue Valleys, the major portion of the country forms part of the central African plateau and lies at an elevation of between 3,000 and 5,000 feet above sea level, rising to 7,400 feet above sea level at Nyika in the Eastern Province. Only the major rivers already mentioned and their larger tributaries have a year-round flow of water, the remainder drying up in the winter months. In general, the plateau has an ameliorated climate and is conducive to the growth of scattered trees with large open savanna zones between. Tall grass covers the flat area around Lake Bangweulu and annual flooding is common, forming impenetrable swamps, which are the breeding grounds of the red locust (*Nomadacris septemfasciata*).

The general elevation of the plateau relieves it of the uncomfortable conditions of heat and humidity usually associated with such inland

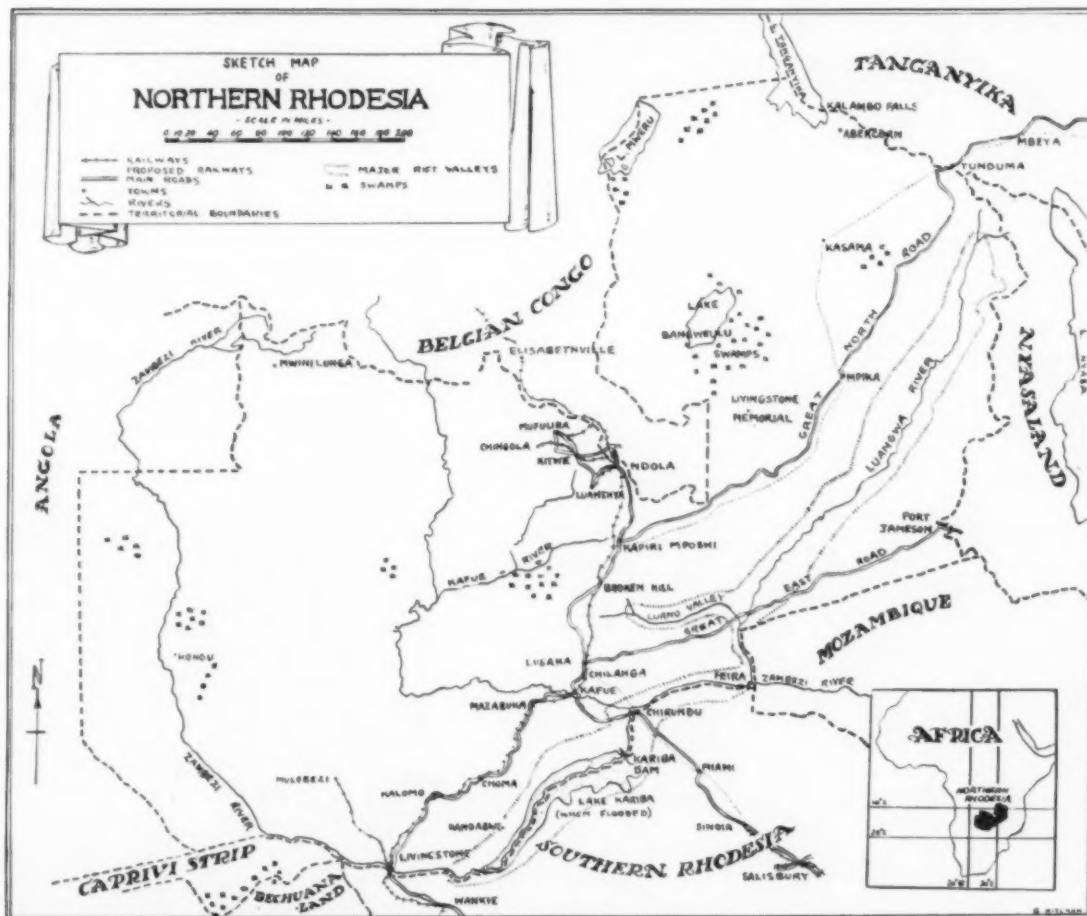
NORTHERN RHODESIA

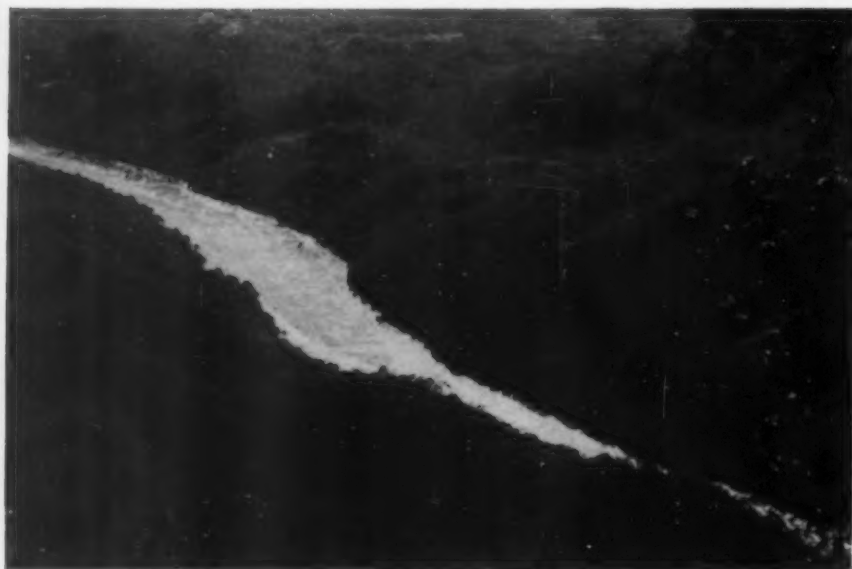
sub-tropical countries and this is reflected in the sparsely populated Zambezi, Kafue and Luangwa Valleys, where in the hot season, daily temperatures are up to 110° or even 120° Fahrenheit by late morning, with correspondingly high humidity near the rivers. The year may be divided into three fairly well-defined seasons, with the rainy season from late October to early April, the winter from May to August inclusive, and the hot season from mid-September until late October. The pleasantest is the winter, with daily temperatures from 72° to 82° Fahrenheit and minimum night temperatures from 40° to 50° Fahrenheit. The humidity is generally low and rains are absent. In the rainy season temperatures are higher during the day (75° to 85° Fahrenheit) and night (60° to 67° Fahrenheit), with rain falling during short sharp thunderstorms and varying from about fifty inches in the north to less than thirty inches in the Zambezi Valley, with a maximum of well over fifty-five inches in the Lake Bangweulu region. The hot season is

transitional to the rainy season, and temperatures and humidity are high, the former rising to above 95° Fahrenheit in the day and 65° Fahrenheit at night. It is during this season and the initial portion of the rainy season that the large lower valleys are particularly unpleasant.

Geology

Geologically, the country may be divided into three major zones: the mid-Zambezi, Luangwa, Kafue and Lunsemfwa Valleys, which are part of the African rift valley system and are floored with sediments of Karroo age (late Palaeozoic and early Mesozoic); Barotseland which has a thick covering of unconsolidated yellow Quaternary sand overlying Precambrian rocks; and the remainder of the country, which has little or no superficial deposits covering the Precambrian basement. These three divisions admirably reflect the vegetation, concomitantly with the climate, the resources, population and general economic status of the country. The native reserve of





A view of Kariba Gorge looking downstream from the north bank.

Barotseland is unsuited for European farming and prospecting; in addition to being banned by law, such activities are virtually impossible due to the blanket of Kalahari sand. The Karroo-floored valleys are dry, inhospitable, very sparsely populated and unsuited for farming without extensive irrigation. Coal deposits (some, such as those recently discovered at Kandabwe being quite extensive) are known, but other economic minerals are virtually absent. Irrigation of sugar has recently been very successfully implemented at Chirundu, some twenty-five miles below the mouth of Kariba Gorge, where the Kariba hydro-electric project is at present under construction. Potential irrigation from this site is tremendous, although its primary objective is the supplying of cheap hydro-electric power to the Copper Belt and the rapidly expanding secondary industries in Southern and Northern Rhodesia.

Transportation and Communication

In a country such as Northern Rhodesia, dissected by fifty or more mile-wide rift valleys with 2,000-foot escarpments in places, and with annual washaways a constant danger to bridges during the rainy season, lines of communication tend to follow the watersheds. For this reason, the country's only rail link with the Union of South Africa enters by the Victoria Falls Bridge at Livingstone and follows the Kalomo-Choma-Lusaka ridge, crossing the Kafue River at Kafue, and then turns north to follow the Kafue-Mulungushi watershed to the Copper Belt, where it links up with the Belgian Congo's railway system. There is access to the east coast at Beira through Bulawayo and Salis-

bury. The four main roads in the territory are along the Livingstone-Lusaka-Ndola watershed, the Kapiri Mposhi-Mpika-Tunduma watershed into Tanganyika, the Lusaka-Fort Jameson watershed to Nyasaland, and across the Zambezi Valley at Chirundu. The latter route crosses the bounding escarpment of the rift valley in two series of hairpin bends with wonderful views across the full width of the valley. In general, the majority of roads have wide *murrum* (dirt) surfaces, with occasional central one-track tarmac strips, although a few have full two-way tarmac and many more hundreds of miles of fully tarred roads are in the planning stage.

Since almost all Europeans travel by car, the bus services are used predominantly by Africans. Connections can be made to the Union of South Africa and Nairobi. Once off the main roads, bush tracks are fairly abundant and are best suited to four-wheel-drive vehicles, while in the more isolated parts the age-old method of native portage is still in vogue. The only use made of navigable waterways is



by African boats, which carry maize and other produce from Chirundu to Feira. Air communications with Europe and South, Central and East Africa are good.

History

The history of the development of Northern Rhodesia is intimately linked with poor communications or lack of any, and the Zambezi River always, until recently, has been a barrier to northward penetration by Europeans from South Africa. The first traders were the Portuguese, who entered from Feira, and it was largely their slave and ivory trading that precipitated the explorations of David Livingstone. These early explorers found the country populated by Africans of Bantu stock, whose past history has only recently been elucidated. The earliest record of human habitation in this portion of the African Continent is that of *Homo rhodesiensis* or Broken Hill Man, but late Stone Age Bushmen have left many traces of their occupation and survived as recently as 1800 in some isolated parts. Between 1000 and 1450 the initial influx of peoples of Bantu stock took place — people who planted small gardens, made pottery and were able to smelt iron. The final wave of migrant Bantu entered Northern Rhodesia between 1450 and 1750 and their bellicose activities finally drove the Bushmen to the fringes of the Kalahari Desert and the weaker earlier Bantu peoples into the less hospitable lower valleys. It was during this time that the Portuguese and Arab slave and ivory trade was at its acme.

The first mission was not established until 1885, and it followed closely on the discovery

of diamonds in South Africa in 1869 and gold in 1886. These discoveries quickened the tempo of exploration and development in which the British Government took a large part, and in October 1889 a Royal Charter was granted to the British South Africa Company to administer those areas obtained by treaty from the native rulers. In eastern Rhodesia, the African Lakes Company was following similar lines of development; but by 1893 the British South Africa Company took over all administration in this portion of central Africa and capitals were established in 1899 in North-Eastern Rhodesia at Fort Jameson and in North-Western Rhodesia at Kalomo — both administered by the British South Africa Company. In 1905 the capital of North-Western Rhodesia was moved to Livingstone and in 1911 both provinces were amalgamated to form Northern Rhodesia.

Low-grade copper ores were discovered in 1925 in what was later to be called the Copper Belt, and the seat of government was again moved to its more central position at Lusaka in 1935. Since that time, copper and tobacco have been the mainstays of the economy. October 1953 marked the formation of the Central African Federation, with a central Federal Government sitting in Salisbury, in addition to the Southern Rhodesian Parliament, and with the governments of Northern Rhodesia and Nyasaland sitting at Lusaka and Blantyre respectively.

Resources and Industries

With Federation as a unifying factor, the resources and industries of Northern Rhodesia

*Right:—
The floods in 1957 nearly washed away the only road bridge connecting both sides of the dam site. Over 100 tons of steel girders were used to weigh down the bridge.*



*Left:—
Floods in March 1957 broke the north bank coffer-dam at Kariba and flooded the site. Note the waters of the Zambezi pouring over the upstream edge of the coffer-dam.*



The dam site at Kariba. Contrast this photograph with those showing the flooding. Behind the road bridge is the longest foot-suspension bridge in the world.

have a great future to play in the development of central Africa. The African population is about 2,110,000, as compared to about 64,000 Europeans; thus there is a vast potential labour market, which only lacks cheap power in order to attract secondary industries. It is to this end that the Kariba hydro-electric project is directed. At Kariba Gorge, under construction since 1955 and scheduled for completion in 1962, is a 400-foot-high, concrete-arch dam that will impound the largest man-made lake in the world — 175 miles long and over forty miles wide, with a shore-line of over 800 miles, and four times larger than the Hoover Dam Lake. The lake will be 390 feet deep at its greatest depth, but over most of the 2,000 square miles will be only about 100 feet deep. Two underground powerhouses are to be built, housing thirteen 100-megawatt generators. The whole project, costing about \$380,000,000, will save the federation about \$280,000,000 in the building of thermal generating stations. By 1972 the cost of electricity from Kariba is expected to be only one-third of a cent a unit. In addition to the supply of electricity to the Copper Belt and secondary industries in the Federation, millions of tons of coal will be saved, which now have to be brought from the mines at Wankie, to the Copper Belt, a distance of over 350 miles, to supply energy for the electrolytic refining of copper. The flow of the Zambezi will be controlled for the first time and about 200,000 acres of land will be available for irrigation, in

addition to the expected 20,000-ton annual fish industry. If the potential development possible from the Kariba undertaking is met, it would appear almost certain that the Kafue Gorge hydro-electric project, temporarily shelved in favour of Kariba, will be started in the next decade or so.

At present copper production and refining is the major industry, with six large mines yielding, in addition to copper, silver, gold, cobalt and uranium as by-products. The lead, zinc and vanadium mine at Broken Hill has been active for many years and uses hydro-electric power from the Mulungushi River in its smelting plant. Other major industries include the Zambezi Sawmills, which fell over 2,000,000 cubic feet of Rhodesian teak every year and export it mainly to the Union of South Africa, and the Chilanga Cement works, situated just south of Lusaka. All other secondary industries are on a minor scale, but much may be anticipated once the Kariba plant is in full operation.

Agriculture

Second only to mining is farming, with maize, cattle and tobacco as the chief products. The farms average between 3,000 and 5,000 acres, with some much larger. The chief export is tobacco, but most European farming is directed to the production of foodstuffs for local consumption. The producing land is located along the railway, the Mwinilungu area in Western Province and the Abercorn, Fort

The first block of the main dam wall being laid inside the north bank coffer-dam at Kariba Gorge. This photograph gives an excellent idea of the size of the coffer-dam wall, and hence of the extent of the flooding in March 1957.



Jameson and Mkushi areas, although some of these areas are barely developed yet. Maize is grown on most farms, and the African smallholder is important to the maize production of Northern Rhodesia. Many farms are mixed, with a pronounced bias in favour of dairying, pigs and poultry and possibly some tobacco. Several large cattle ranches have been established over the last decade. Tobacco is grown chiefly along the railway in the Livingstone-Choma area and in the Eastern Province, and is mostly flue-cured Virginia tobacco, which is auctioned annually in Salisbury. Turkish tobacco is grown in small quantities by some farmers but in general is not too popular because of the great amount of labour required and the fact that the price is fixed and in recent years has been lower than the auction price for good grade Virginia tobacco. A few European farmers are now growing rice successfully in Western Province and citrus fruits would yield good profits along the railway if the land were under irrigation. A successful recent venture was the production of sugar cane at Chirundu, using water from the Zambezi for irrigation. More developments along these lines will be possible once the dam at Kariba is completed. Fishing is largely in the hands of Africans, but the potential of Lake Kariba remains unknown.

People

Facts and figures as given here are deceptive, and although the country may appear to be

booming — as indeed it is — there is, as in almost all countries in Africa, that underlying conflict of black versus white. With a ratio of thirty-three Africans to every European and the opposing ideologies of potential future independence promised for the Africans by the Colonial Office versus the multi-racial partnership and potential dominion status promised by the Federal Government, it is only to be expected that both literal and verbal clashes occur. The underlying theme behind Federation was the production of a self-governing multi-racial dominion within the framework of the British Commonwealth. A high ideal, but one which is rather in conflict with the past promises of the Colonial Office to tender eventual self-government to the British-protected Africans in Northern Rhodesia and Nyasaland.

Seventy years ago the African was a savage, but today many Africans have received a smattering of lower grade education and have a considerably higher standard of living than previously. The average African completely fails to realize that the car his *Bwana* drives or the house he lives in are commensurate with a vastly different educational level. The new multi-racial university at Salisbury will provide him with opportunities to develop to a level equivalent to many of the Europeans, but it may take years to change his outlook, and social patterns of people cannot be changed by legislation. The African political leader sees "black" dominions developing in West Africa and desires



*Above left:—
A granary for African mealie.*



*Above right:—
African children in a village.*



*Right:—
Siesta time in an African village.*

the same for the Federation. He also sees the stringent rules of apartheid applied in the Union of South Africa and desires to travel as far from such a state as possible. This situation is fraught with difficulties for the administration, since, although segregation is practised, it is not in conformity with the Federal policy of multi-racial partnership. The crux of the problem lies in the nursing of the African along the road to political, social and economic equality with the European and yet making it clearly understood to him that until such time he must remain subservient, since no community can function smoothly while the reins of authority are in the hands of politically, socially and economically immature persons.

In addition to the political colour problem, there is an industrial colour bar which is most strongly operative in the Copper Belt — a colour bar that has resulted in several recent strikes by the African Mineworkers Union. The African, compared to the European, seems indolent with a strongly sophomoric attitude, and can rarely be induced to produce work equivalent to that of a European. His wages

are correspondingly lower; yet he fails to realize that increased work and responsibility go with increased pay and that past experience has shown this to be the case. The few Africans who have shown ingenuity and diligence have been amply rewarded financially and socially.

Probably the key to the whole problem is the considerably increased education of the African and his gradual assimilation into the political, social and economic structure of the Federation. Conversely, the greatest danger to the welfare of the Federation is the African who has received only a smattering of education, say up to grade eight, and who imagines he is well educated, since he is, in relation to the majority at the present time. He is the one who most strongly demands equality with the European. It is pertinent to sum up by noting that the greatest danger to all countries in Africa lies in not giving the African sufficient scope to develop his education. The probable result of not doing so might be summed up in the words of Stuart Cloete, who said "If a man can read the instructions for servicing a tractor, he can also read the Communist Manifesto".

EDITOR'S NOTE-BOOK

Ralph R. Krueger (*The Disappearing Niagara Fruit Belt*) is an instructor in the Department of Geography at Wayne State University, Detroit. A native of Ontario, he studied at the University of Western Ontario, London, where he received his undergraduate and M.A. degrees. He spent two summers doing research in the Niagara fruit belt for the Ontario Department of Agriculture and two years since that time on his Ph.D. dissertation research: "Changing Land-Use Patterns in the Niagara Fruit Belt" (Indiana University).

* * *

Dr. H. J. Scoggan (*Some Canadian Wild Flowers*) is a botanist on the staff of the National Museum of Canada and Donovan Clemson is a free-lance photographer from British Columbia whose work has appeared previously in the Journal.

* * *

R. A. J. Phillips (*Northern Neighbour*) is on the staff of the federal Department of Northern Affairs and National Resources. Formerly Chief of the Arctic Division he is now Assistant Director in the Northern Administration Branch.

* * *

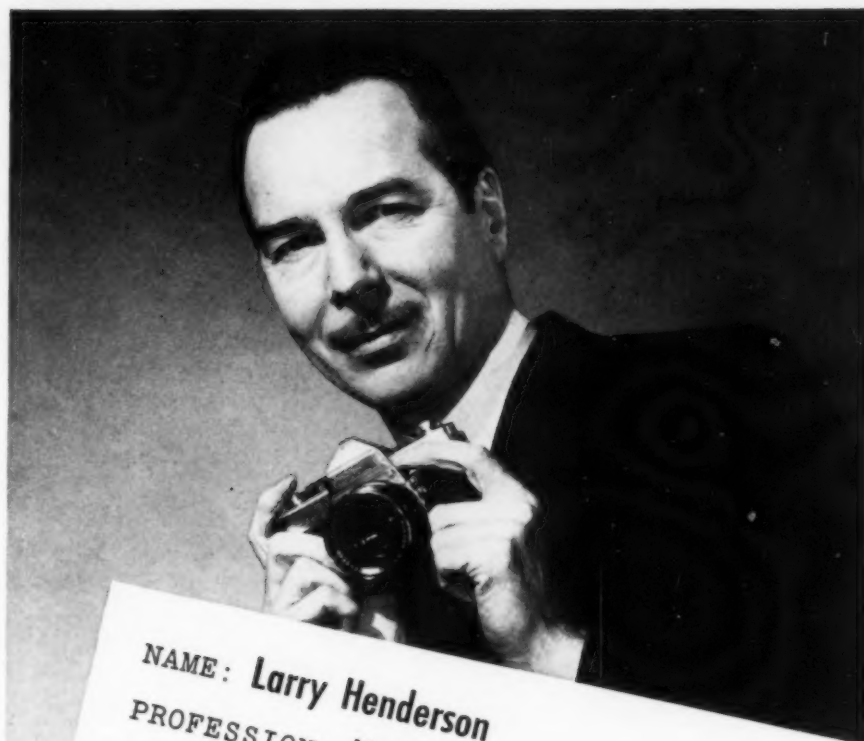
Dr. Brian Hitchon (*Northern Rhodesia*) is a petroleum geochemist with the Research Council of Alberta. He was born in Canada and educated in England, receiving his B.Sc. and Ph.D. degrees from Manchester University. He spent almost two years in Northern Rhodesia with the Northern Rhodesia Geological Survey.

AMONGST THE NEW BOOKS

Modern Architecture in Brazil
by *Henrique E. Mindlin*
(Reinhold Publishing Corporation,
New York, \$12.50)

One need not be an architect to be fascinated by this book. Even without the letterpress, its illustrations would tell a clear-cut and exciting story, "a story," says the author, "of a handful of young men and a body of work brought into existence with incredible rapidity. In less than a generation, an idea which barely had time to take

(Continued on page VI)



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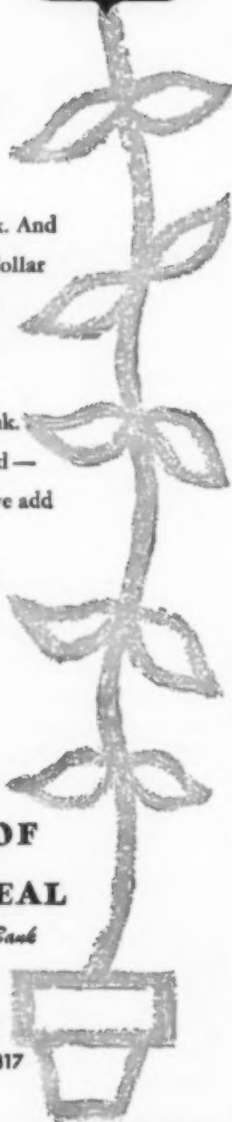


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(Continued from page V)

root in São Paulo and Rio de Janeiro had flowered and reached a paradoxical maturity."

In his preface, Professor Giedion observes that, happily, creative work is suddenly appearing in countries which yesterday would have been regarded as backward. He cites Finland and Brazil. What have they, he asks in effect, that other countries lack and that has inspired this extraordinary creative upsurge? He answers his own question thus, especially in regard to Brazil . . . "Financial support and the clients, governments and administration that do not hamper real talent. The trouble in present day architecture is due to the fact that the backbone of the architect . . . is broken by the taste of the clients. In Finland and Brazil this is not the case. No misdirected resistance is killing the creative impulse." Fortunate Brazil!

The entire history of Brazil covers only four and a half centuries from the day of primitive Indian huts to the present with its elegant, fascinating, practical modern architecture. Progress in history has gone hand-in-hand with building, through the first structures showing Portuguese influence, through French refinement attributed largely to Le Corbusier, to the bold creations of the Brazilians themselves.

The path was not always smooth. Once, a revolution nearly took place when groups of people clamoured for the abolition of the traditional shutters presumably designed to protect a home's occupants from the sun but actually serving to shut women away from the world. Again, a serious split occurred between those favouring foreign influence and those who insisted on native design. Now, the modern is firmly established and its curious non-uniformity has become uniform; and prevails.

Excitement grips the visitor walking through the modern streets of São Paulo or Rio. An immense apartment house shoots into the air, looking like a checker-board, upended. Another building flares with low, sweeping curves reminding one of a white hood, its roof rounded like half an egg shell. An unexpected factory making penicillin as well as other pharmaceuticals, thrusts high an amazing water tower enclosed in circular concrete rings that act as a *brise-soleil* for keeping the temperature of the water down and thus reducing the expense of cooling it.

In sharp contrast, there is a detail of the altar in São Francisco de Assis church, the work of the Little Cripple, Antonio Francisco Lisboa, more than 100 years ago, and that



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shows the skilful manner in which sculpture was integrated with architecture. Much of this type of work condemned by the moderns as "unrealistic", but there are those who look with reverence at the never-to-be-surpassed wood carvings and the gold-and-silver richness of interiors.

"Realistic" probably is the Alice-in-Wonderland apartment building that gives a fantastic impression of sticking out its tongue at the beholder. The design was an attempt to lessen the feeling of confinement by extending one room far beyond the wall of the structure. It has to be seen to be believed.

A modern stadium and a swimming pool—the latter with seating accommodation for 4,500 spectators—seem conventional in comparison with a modern church! At first glance, the church looks like a shell bandstand so popular in outdoor recreation grounds. The author says in part: This little church with its novel structural shapes adapted to the technical possibilities of reinforced concrete, illustrates the urge for constant plastic research that distinguishes his artist (Oscar Niemeyer) and enables him to depart successfully from the more Cartesian conventions of modern architecture." Is it safe to state that lovers of Christopher Wren would not like it? There is no uplifting line, no slender spire, nor anything to suggest that 'architecture is frozen music'. From the outside, it might well be a building devoted to sport, or even an exhibition structure of some kind.

The theatre with its odd outlines is more acceptable to the passer-by, and one regards the Ministry of Education and Health with something akin to awe, for it is the most striking and spectacular building in Brazil. One can only say that its conception and execution make it a symbol of the most modern, and "realistic" architecture that exists anywhere at the present time.

The book contains 450 illustrations displaying the work of seventy artists. The pictures include not only public and administrative buildings, hospitals, blocks of flats, banks, terminals for train, plane, bus and sea-craft, but private homes and landscaped gardens. The private homes are of infinite variety; some severe, some with curving irregular lines, all charming. They inspire the desire for possession, perhaps for emulation, although most of those built with regard to sun-protection would be quite unsuitable in a northern climate.

What a picture book is to a child, this volume is to an adult; the door

(Continued on page VIII)

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(Continued from page VII)

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Mrs. Madge Macbeth has published more than seventeen books, and written hundreds of feature articles on her varied travels.

* * *

Hurt Not the Earth

by E. Newton-White

(Ryerson Press, Toronto. \$4.95)

This book, as stated on the jacket, deals with the exploitation of our renewable natural resources, soil, water, forests and wildlife, in the development of Canada. It is also, as stated on the jacket, highly controversial.

The author, after a general and wide-ranging introduction of his thesis, deals with the history of and mistakes and problems in wildlife management in Canada. He then traces the history of forest use and misuse from days of first settlement to present date. He devotes a section to the forest fire problem.

Soil and water resources are then discussed, with special comment upon

land colonization policies. A plea is very properly made for maintenance, in perpetuity, of maximum fertility of our soils. The author then devotes a section to the conservation principle as he sees it, and to the problems in maintaining such in our present age. Finally he devotes a section to summary and suggested remedies for the renewable resource crisis that he sees.

This book is so general that critical review, in the space permitted, is not possible. It may suffice to say that there is much basic truth in the history of resource exploitation as presented, but the almost complete lack of factual data in the presentation makes it impossible for the reader to judge for himself or herself just how wrong the actions were that were taken in the past, and just how serious the situation is today. One cannot say that all is well with our renewable resources — far from it. There is, as the author states, need for urgent interest and concern on the part of every Canadian. It is not believed, however, that the comments of the author, and the implications thus left, present a fair picture of the situation today, or for the last ten years or more at least. And it is hoped that few Canadians today will agree that our conservationists, conservation organizations and conservation policies constitute "... in general an inept, inadequate, hidebound system, completely impotent in the resource crisis now building up."

Study of the numerous reports available to the public emphasizes the need for caution in accepting too fully the sweeping, though colourful, generalizations on resource conditions made throughout the book. The progress of the last ten to twenty years, in renewable resource research and management, will cause many to question the comment: "The nation built out of Canada is an achievement to boast about; boasting which has somewhat less point, however, *because here were the makings of something much greater than we have or can now hope to have.*" The italics are the reviewer's.

There is much more in the book with which one might quarrel, but some comment should be given for the credit side. Too few are willing to place responsibility for good renewable resource management where it belongs, but the author consistently makes his point that the responsibility lies with each one of us. He is not afraid to speak of the "love of the land trait," and to relate conservation to religion. So here again is a call for a land ethic and it is heartening to read.

Ten remedies are suggested for the situation, and two of these at least

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will raise controversy. Readers will have a field-day arguing the proposal that we "gear the national economic system to (renewable?) resource husbandry" and "effect such a population balance as will allow intensive home use of the resources . . ." The proposal that our living resources be all returned to small private enterprise and ownership under regulation will raise the question, so often discussed among conservationists, of how far you can go, by regulations, in forcing the private individual, who has paid for his holdings, to use renewable resources in a manner that will guarantee their maintenance undiminished in perpetuity. Nor can one dismiss the fact that today some of the best farm and forest management is being as well carried out by large corporations or enterprises as by private individuals.

In conclusion, here is a book directed to much needed public information respecting renewable resource use in Canada. The underlying theme of need for public interest, understanding and action is good. It is suggested, however, that any prospective reader have at hand factual resource references, such as those mentioned earlier in the review.

W. WINSTON MAIR.

Mr. Winston Mair is Chief of the Canadian Wildlife Service in the National Parks Branch at Ottawa.

* * *

Of Men and Marshes

by Paul L. Errington

(The Macmillan Company,
New York. \$4.50)

Few persons could be better qualified to write of men and marshes than Dr. Errington, who grew up on a farm in the pothole country of South Dakota, later earned his living by trapping in the marshes there, and ultimately, as a trained biologist, specialized in the study of marsh-inhabiting wildlife. Small wonder it is, then, that Errington writes with such fulness and precision, yet also with passion and imagination. Perhaps this is as good a place as any to observe also that Hochbaum's sketches are well in accord with the text, having the same characteristics expressed in graphic form.

The first third of the book is devoted to descriptions of the glacial marshes of the north-central United States prairies during the different seasons. Marshes are packed with life, both plant and animal, of bewildering variety and quantity, and Errington's descriptions of them convey this vital quality in full measure. Carefully portrayed are not only the physical

(Continued on page X)

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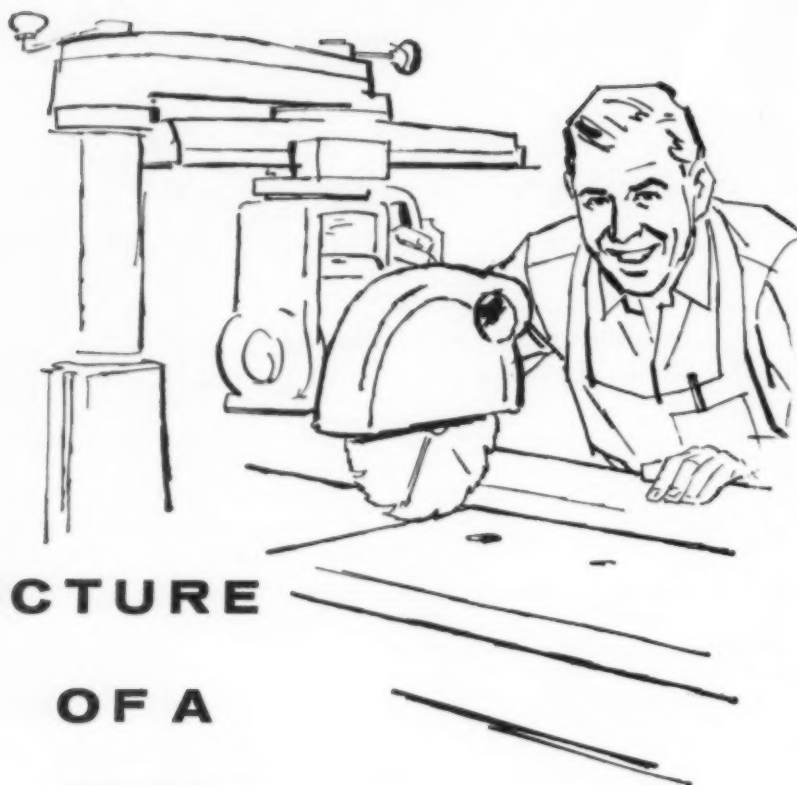
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Sun Life of Canada

(Continued from page IX)

changes such as the thawing of ice and the rising of water in the spring but also such biological phenomena as the emergence of new growth of rush and reed, the appearance of migrant birds such as ducks, geese and waders, and the burgeoning of activity among such resident species as snapping turtles, mink and muskrats.

A lengthy chapter is devoted to marshes other than those of the north-central United States and Errington draws interesting comparisons between those with which he is most familiar and such diverse types as the desert marshes of the Great Basin, the beaver ponds of the high Rockies and the thin-soiled marshes of the Precambrian Shield. In another chapter there is a most interesting account of the biological significance of islands in marshes.

While Errington is obviously quite at home in a marsh, tacit admission that others may not share his familiarity is afforded by the chapter entitled "Of Marshes and Safety and Comfort". Good advice is given on how to deal with mud and ice, and how to avoid unnecessary discomfort resulting from the weather.

Throughout this book there runs the thread of life's interrelationships — how mink live with muskrats, how muskrats live with each other, and how different species of herons and bitterns occupy habitats characterized by different associations of plants.

But the most distinctive quality of this book is in its discussion of men and marshes and this reaches a climax in the last few chapters. "At times, one of man's greater needs is freedom from himself", Errington writes, and "a glacial marsh is one type of predominantly native wilderness that we usually can retain after all of the others are lost in a thickly settled community — if we as the public really want to". Writing of man's experiences in marshes — hunting, trapping and just watching — Errington provides ample evidence of the pleasures that can be obtained there. He is convinced that the public is not "going to be satisfied with a man-ordered world of cultivated fields and pastures and landscaping and roads and buildings", and thus he thinks that now is the time to start planning for our future needs of wild lands and to take action to save them before it is too late. Errington's plea for wise use of marsh lands is forceful but not intemperate, and for that reason his book, if it is read as widely as it deserves to be, should be of great benefit to the cause of conservation.

Because marshes abound with life

and are ecological units with at least fairly well defined natural boundaries, they are desirable sites for study of the phenomena of population changes. Objective study of the behaviour of populations of muskrats and other marsh inhabitants can yield data which may well suggest the nature of mechanisms governing the group behaviour of man. "The laws of life can, most assuredly, catch up with man", says Errington.

"The lessons as well as the beauties of marshes await the perceptive, as do the lessons and beauties of the skies, of the seas, of the mountains, and of the other places remaining where man can still reflect upon lessons and beauties that are not of human making". And after only a few paragraphs, the perceptive will realize that the lessons and the beauties will be the more apparent as a result of reading Errington's book.

D. A. MUNRO.

Mr. D. A. Munro is chief ornithologist in the Canadian Wildlife Service, National Parks Branch, at Ottawa.

* * *

British Columbia Rides a Star by Vera Kelsey

(J. M. Dent & Sons Limited,
Don Mills, Ontario, \$5.00)

The Province is discussed under eight districts:

The Coast, North-Central British Columbia, The North, Vancouver Island, The Cariboo, The Okanagan, The Kootenays, and The Lower Fraser Valley. This book is a travelogue describing the author's impressions as she travelled by steamer, train and bus successively through the eight districts into which she divided the Province of British Columbia. Co-travellers are a part of the story and their tales are woven into its fabric. Descriptions of stopping places, towns, pulp-and-paper plants, mines, smelters and abandoned camps are interlined with historic accounts and not-too-happy geological explanations of land forms. The author's style is clear, vivid, decisive.

The Gold Rush of '58, the Overlanders, the great mining camps — Barkerville, the Boundary, the East Kootenay, Stewart; the fruit belt of the Okanagan, the stern-wheel steamers on the Okanagan, Arrow and Kootenay Lakes; the stories of Cariboo Cameron (in new version), "Ogo-pogo" and "Cadborosaurus", the monsters of Okanagan Lake and Cadboros Bay — they are there with vivid accounts of mine discoveries and wide-open mining towns. The descriptions of the cities, ending with Vancouver, are vivid and original.

As a new-comer, Vera Kelsey has

gathered a mass of material into readable form, more particularly adapted to the interests of other newcomers.

A few mistakes occur: Mount Waddington (13,260 feet) is not British Columbia's highest mountain; it is Mount Fairweather, with an altitude of 15,300 feet. The Pine Pass has an elevation of 2,850 feet, not 3,800 feet as stated. There is no granite in Pine Pass but much quartzite. Again the Parliament Buildings, Victoria, are built of andesite, not granite. Charles Eugene Bedaux had nothing to do with the Alaska road. He went up the Halfway River and through the Laurier Pass.

Itinerary by Districts: The Coast — The author travelled by steamer from Vancouver north through the inside passage, stopping at Alert Bay, Bella-Bella, the pulp-and-paper towns of Powell River and Ocean Falls, and the aluminum town of Kitimat. Crossing to the Queen Charlotte Islands, stops were made at the Haida Indian towns of Masset and Skidegate Mission, at Queen Charlotte City and Port Clement.

North Central British Columbia — Starting from the port city, Prince Rupert, the author travelled by Canadian National Railways up the Skeena Valley through Bulkley Valley to Smithers, on through Burns

Lake and down the Nechako to Prince George.

The North — Travel was by bus from Prince George over the Hart Highway, past Summit Lake, down the Crooked and Pack Rivers, across the Parsnip River, over the Pine Pass, down the Pine River to East Pine, and across the plains to Dawson Creek.

By Alaska Road, the bus crossed the Peace River bridge to Fort St. John and on and on north through the mountains to the Liard River-crossing and passing up its valley to Watson Lake just inside the Yukon border.

Vancouver Island — Crossing to Victoria from Vancouver by steamer through the Gulf Islands, a bus is taken up the island highway over the Malahat to Nanaimo. Another bus carried the author to Campbell River to glimpse the competition for the "tyee" Salmon Derby.

By bus back south to Qualicum and over to Port Alberni, the author visited Cameron Lake, Cathedral Grove, Sproat Falls and Great Central Lake before boarding the *Princess Alberni* for a trip up the west coast of Vancouver Island. On this trip, stops were made at Ucluelet, Tofino, Estevan Point, Muchalat Inlet, Nootka Sound, Tahsis Inlet,

(Continued on page XII)

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(Continued from page XI)

Esperanza, and the old mining town of Zeballos (its four mines have been closed for five years). The last stop to the north was Chamiss Bay, on Kyuquot Sound, as there was no freight for Port Alice, the home of the whaling fleet. Turning south the ship passed Bamfield, the terminus of the 7,830-mile cable from Australia, stopped at Clo-oose and sailing through the Strait of Juan de Fuca returned to Victoria.

The Cariboo — By steamer to Squamish, the author travelled by Pacific Great Eastern train to Quesnel, passing *en route* Garibaldi Mountain and Park, Bridge River, Lillooet, Clinton, and Williams Lake. Bus transportation completed the trip to the ghost town of the gold rush days, Barkerville. The railway provided transportation through the Kamloops-Nicola area.

The Okanagan was entered by railway and traversed by bus past Vernon, Kelowna, Penticton and Osoyoos.

The Kootenays — Entering Revelstoke by Canadian Pacific Railways, the author travelled through the country variously by railroad, bus, ferry and even by the stern-wheeler *Moyie* on one of her last trips on Kootenay Lake.

The description of the finding of mines and development of the mining camps and resulting towns and smelters is interesting reading.

The Lower Fraser Valley was followed by train from the Fraser Canyon to Vancouver with side transportation by car over its broad farm lands.

The title of this book *British Columbia Rides a Star* is also the title of Chapter 26, with sub-title *Monashees, Kettle Valley, Arrow Lakes*. It is taken from a chance remark by a fellow traveller, Fred, as the Kettle Valley Railway provided a breathtaking view of Lower Arrow Lake.

M. Y. WILLIAMS.

Dr. M. Y. Williams was formerly head of the Department of Geology and Geography at the University of British Columbia and was also on the staff of the Geological Survey of Canada.

* * *

The University Atlas

*Edited by Harold Fullard and
H. C. Darby*

(Moyer School Supplies Limited,
Toronto. \$6.25)

Between 1937 and 1953 this well-known atlas ran to seven editions. This eighth edition is a worthy successor to its predecessors and has been completely redesigned so as to

incorporate many of the post-war changes in the geography of the world. But tradition dies hard and this edition still includes two world maps on Mercator's projection — one showing volcanoes and earthquake zones and a world political map. To Canadians the latter is always disappointing as the whole of Canada can never be shown and what does appear is so exaggerated in area that false impressions of size are created. To some degree this has been remedied by the two maps which follow it and which show the world in hemispheres (on the oblique Azimuthal Equidistant projection).

The first fourteen pages of the atlas are taken up with black and white climatic graphs. The maps proper begin with a series showing world geology and structure, climate, soils, vegetation and density of population. This is followed by two interesting and useful maps of the North and South Polar Regions which show the routes of explorers and the extent of drift-ice, spring pack-ice and permanent pack-ice. Pages eighteen to 176 are continental and regional maps, the scale of which has been deliberately increased in this edition so as to show more detail. Twenty pages are devoted to North America. These include three double-page bathy-orographical maps: one entitled "Canada" (although it does not show the Queen Elizabeth Islands) on a scale of 1:15,000,000, and one each on Western and Eastern Canada on a scale of 1:7,000,000. These abound in up-to-date details although the speed of events is evidenced by the fact that Burnt Creek is shown despite the fact that it has long since disappeared and its site eaten into by the open pits of the iron ore mines of the Labrador Trough. It is also a little puzzling to find Dawson printed in the same style of type as much larger settlements such as Lethbridge and Medicine Hat while Whitehorse and Yellowknife, the largest settlements north of 60°N are much less prominently labelled.

There are obvious differences in style between the maps, possibly due to the fact that some are entirely new in this edition while others are essentially the same as they were in previous editions. The "new" maps such as West Africa, are much more modern in appearance, much more delicate in their line work and contain many more place names than the "old" ones, such as New Zealand which are almost crude by comparison.

The index is very comprehensive. Indeed it has been increased in scope and now contains over 50,000 entries. A final feature of this atlas which

post-war add to its established appeal is the more compact size of nine inches by twelve inches.

N. L. NICHOLSON

Dr. N. L. Nicholson is Director of the Geographical Branch, Department of Mines and Technical Surveys, Ottawa, and is responsible for the production of the Atlas of Canada.

* * *

Lights on the St. Lawrence

Edited by Jean L. Gogo

The Ryerson Press, Toronto. \$6.00

With so much being written about the St. Lawrence of today, we are fortunate to have a book that looks at many of the river's yesterdays. Miss Gogo has edited an anthology of writings — non-fiction, fiction, and poetry — about the river, many of them by some of the outstanding authors of North America: Stephen Leacock, Francis Parkman, Marjorie Pickthall, Marius Barbeau, and many others. The editor has selected her material with such care that her book presents not just a history and a picture of the St. Lawrence but of eastern Canada as well.

The book is divided into five parts. In the first section, the editor sets her scene with some general articles about the importance of the St. Lawrence. Then she tells of the first men and women along the river's lower course, from Jacques Cartier to the pilots of the river boats. In the third part she concentrates on the rapids of the river's middle section. To many readers this will be the most exciting section, for the rapids and the canals lend themselves well to colourful narrative. Moving on, the editor devotes the fourth part to the settling and the settlers of the upper St. Lawrence. Having covered the length of the river, she turns to legends that involve the river or the people along it for her final section. Although all of the material has been published before, the reader is sure to find a great deal that is new to him. And some misconceptions may be cleared up. For instance, it is still often said that Champlain's shooting of some Iroquois brought about the Iroquois hatred of the French. But Arthur Lower points out that it was more the westward push of the French, that caused the Indians to fear for their lands and their rights. Because Miss Gogo never loses sight of the fact that the story of the St. Lawrence is the story of people, her book is consistently interesting.

CHARLES PAUL MAY.

Mr. C. P. May works in the editorial department of the Book of Knowledge in New York.

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